

SG50K3 PV Grid-Connected Inverter



User Manual
SG50K3-3A-E-Ver27-200907
Version: 2.7

Sungrow power supply Co. Ltd.

Table of contents

1. Symbols Explanation	1
2 Introduction.....	2
2.1 Grid-Connected PV inverter.....	2
2.2 How to use this manual	2
3. Safety Instructions	3
4 General Descriptions of SG50K3.....	4
4.1 Circuit Description.....	4
4.2 The Wiring Interface	5
5. Operation	6
5.1 Operation Modes	6
5.2 Modes Transition	7
5.3 Emergency Stop Button	8
6. Data Interface	9
6.1 LED Indicators.....	9
6.2 LCD Control Panel.....	10
6.3 Explanation of the Display Symbols	11
6.4 The Total Display Menu	12
6.5 Additional Explanation of the LCD Menu	13
6.6 The Default Display Menu	14
6.7 Check Running Parameters.....	15
6.8 Check Fault Records	17
6.9 Start the Inverter	18
6.10 Stop the Inverter	19
6.11 Entering the Password	20
6.12 Change Display Language	21
6.13 Change Date and Time	22
6.14 Output Energy Value Adjustment.....	23
6.15 Load Default Setting	24
6.16 Displayed Real-time Parameters Adjustment.....	25
6.17 Communication Parameters Setting	26
7 Installation	27
7.1 Checking for Shipping Damage	27
7.2 Basic Installation Requirements	27
7.3 Mechanical Mounting	28
7.3.1 Safety Mounting Instructions	28
7.3.2 Device Dimensions and Weight	29
7.4 Electrical Connection	30
7.4.1 Electrical Connection Requirements	30
7.4.2 Wires connection	31
7.5 Communication Installation.....	33
7.6 Start and close	34
7.6.1 Start the Inverter.....	34

7.6.2 Close the Inverter	34
8 Technical Data	35
8.1 Electrical Specifications	35
8.2 Mechanical Specifications	35
8.3 Features	36
9. Appendix	37
9.1 Exclusion of Liability	37
9.2 Contact Us.....	38

1. Symbols Explanation

Please note the following explanation of the symbols used in this manual.



WARNING!

This indicates a condition that can cause fatal injury or death.



NOTICE!

This indicates a condition that will help to achieve optimal system operation.



Caution!

This indicates a condition that may cause minor or moderate injury.

2 Introduction

Thank you for buying the SG50K3 from Sungrow. We hope that the device will meet with your satisfaction when you use it with your PV plant system.

2.1 Grid-Connected PV inverter

A SG50K3 grid-connected PV system is shown in Fig.1. SG50K3 transforms the direct current generated by the PV array into stable alternating current and output to the utility grid.

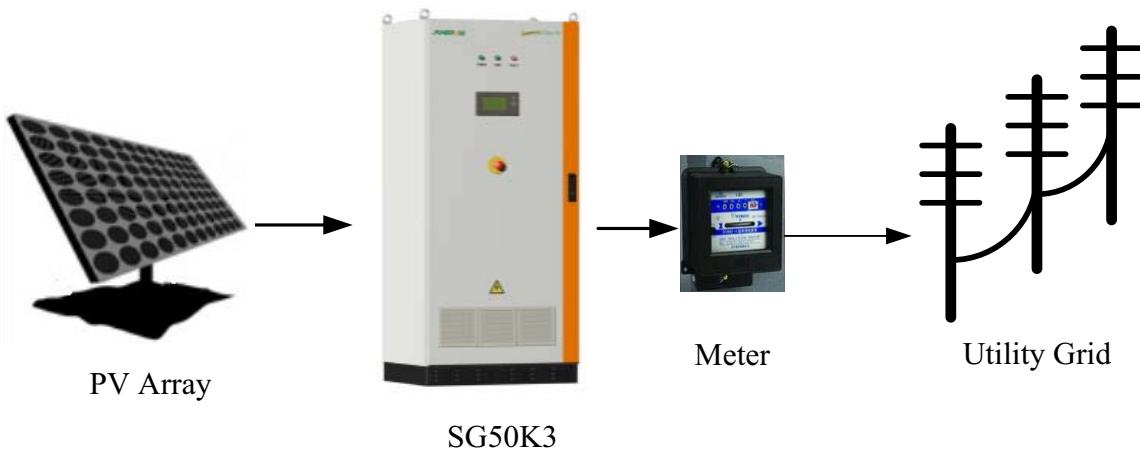


Fig.1 Grid-connected Inverter for PV power application

2.2 How to use this manual

The purpose of this manual is to provide users with detailed product information and instructions for the use of the SG50K3 grid-tied PV inverter.

3. Safety Instructions

- Please read the instructions in this manual carefully before installing and operating the SG50K3.
- Always disconnect the inverter from the grid first.
- **ALL CONNECTIONS SHOULD ONLY BE UNDERTAKEN BY QUALIFIED PERSONNEL.**
- All electrical installations shall be done in accordance with local and national electrical codes.
- Please contact your authorized system installer if any maintenance is required.
- **Connection of the SG50K3 to the utility grid must be done only after receiving prior approval from the utility company and performed by qualified personnel.**
- Completely disconnect the output from the PV array before connecting to the SG50K3 or use other methods to prevent electrical shock hazards. This is important because if the PV array keeps connecting during the connection process may produce dangerous voltages.

WARNING!



Make sure that the DC input voltage never exceeds 880V. Higher input voltages will damage the SG50K3 and will lead to the loss of any and all warranty rights.

4 General Descriptions of SG50K3

4.1 Circuit Description

Fig.2 shows the main circuit of SG50K3 -a transformer grid-connected inverter. An IGBT full-bridge converts the DC power to AC voltage and current. The AC power is then fed to the grid after being processed by a filter and a transformer.

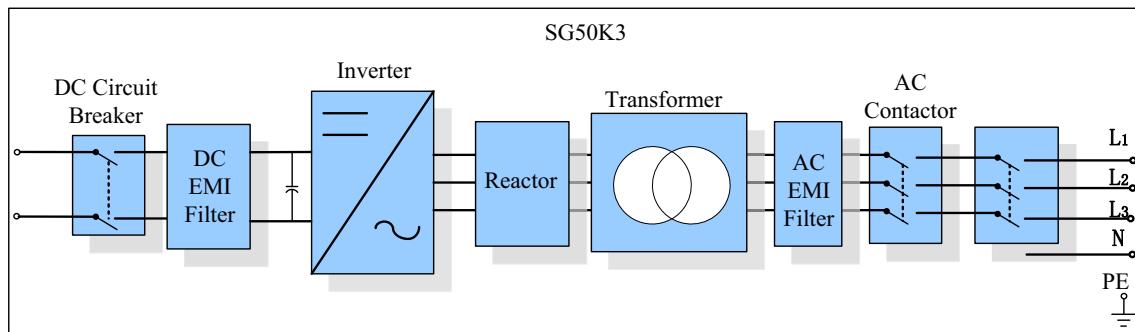


Fig.2 circuit diagram of SG50K3

4.2 The Wiring Interface

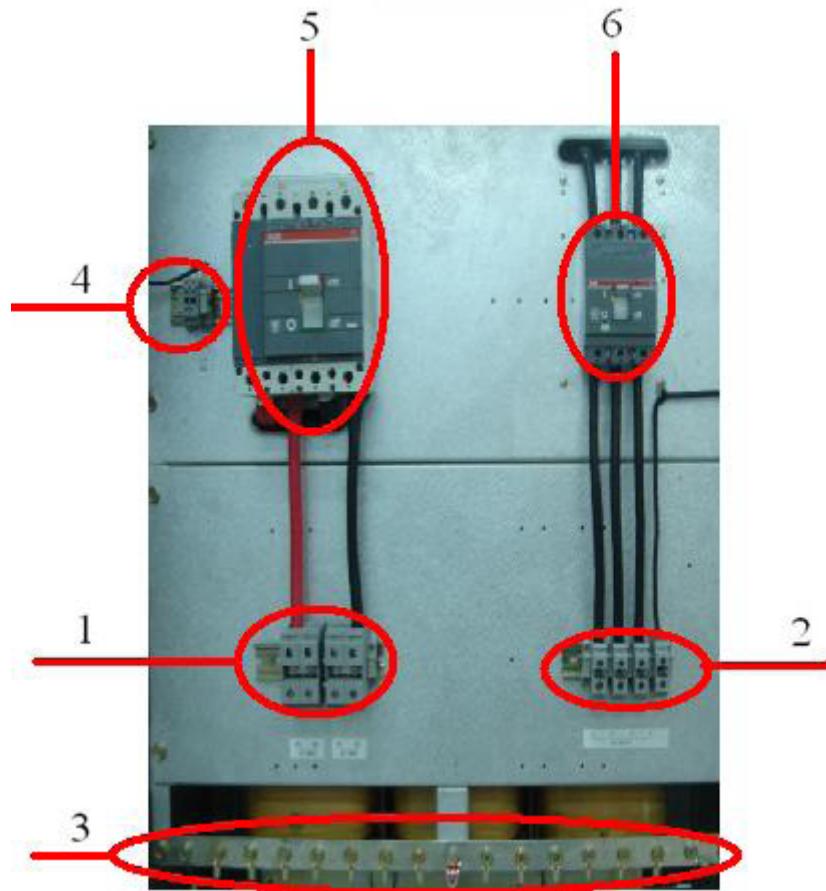


Fig.3 The wiring interface of SG50K3

Table4-1 Terminal descriptions

Terminal No.	Description
1	DC INPUT: Connected to the PV array
2	AC OUTPUT: L1,L2,L3, and N
3	GND :ground copper bar
4	RS485 A/B serial communication port
5	DC Circuit Breaker
6	AC Circuit Breaker

5. Operation

SG50K3 inverter is a fully automated grid-connected solar inverter with friendly user interface. The details of operation are as follows.

5.1 Operation Modes

The modes displayed in the LCD interface include: “**Start-up**”, ‘**Stand-by**’, “**Run**”, “**Fault**” and “**Stop**”. Their explanations are given below.

Start-up

Once the AC and DC connections are OK, all the parameters meet requirements, the AC and DC main switches are closed, The inverter will auto start.

If the input voltage is below the start voltage **470V**, the inverter keeps in “**Startup**” state.

If the input voltage exceeds **470V**, and holds the value for **1 minute**, the inverter is ready for operation; it begins feeding power to the grid and the state changes from “**Start-up**” to “**Run**”.

Stand-by

Standby-mode is entered for insufficient input power($P_{pv} \approx 0$ for 3 minutes), at stand-by mode the inverter will wait until the DC voltage recovers to 470V for 3 minutes.

Run

After being energized, the inverter tracks the PV arrays' maximum power point (MPP) and converts the DC power to AC power.

Fault

If a fault occurs during operation, the SG50K3 will automatically stop operation, disconnect the AC contactor and the display the fault type in the LCD panel with the “**Fault**” LED burns.

Once the fault is removed for 5 minutes, the SG50K3 will automatically resume running.

Stop

The SG50K3 will stop operation by manually stopping the inverter through LCD menu or pressing down the “Emergency Stop Button”, this condition needs manual restart through LCD menu.

During the “**Stop**” mode, the SG50K3 will block the driving signals that control the switching IGBT and disconnect the SG50K3 from the grid by switching off the AC contactor.

Note that the auxiliary power supply for the control circuits of SG50K3 are drawn from the AC side so SG50K3 can perform 24 hour monitoring.

5.2 Modes Transition

When energized, the inverter switches states from different modes as pictured below. When deactivated, the inverter return to the operating mode "Stop".

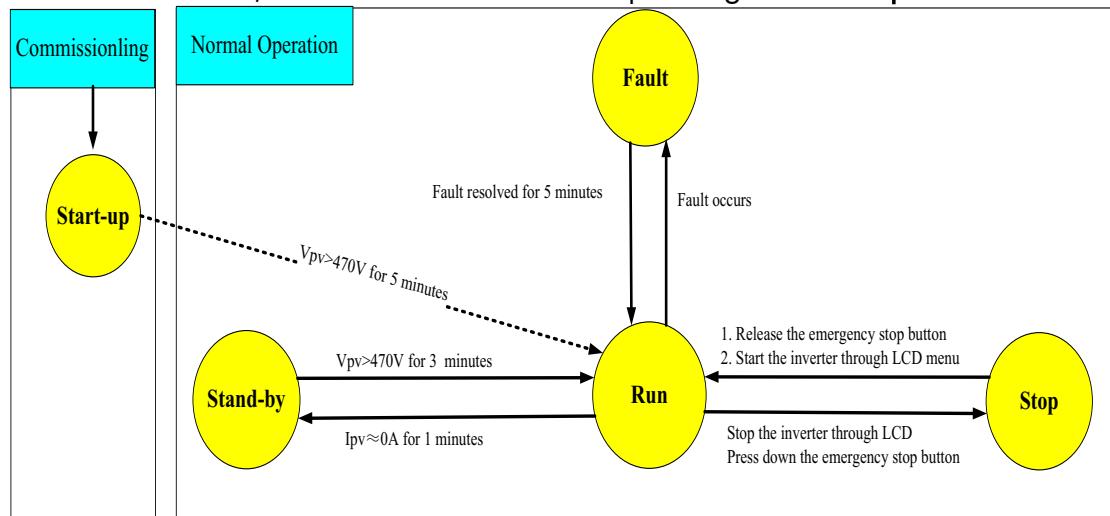


Fig 4 Transition of operation states

* V_{PV} is the DC input voltage; P_{PV} is the DC input power

The states displayed in the LCD menu are explained in the table below.

Table 5-1 State explanations of inverter

Possible displayed State	Explanation
RUN	The inverter is in operation and output power to the grid
STOP	The operation is stopped by stop command
Startup	The inverter is under activation
Stand-by	The operation is ceased by insufficient PV power
*Fault type	A fault is occurred and not solved

*the characters "Fault type" itself will not be displayed during a fault condition, but the real fault type will be displayed like "Vdc-high" or "Vac-low" etc.

- The "Com-flt" shows that there is a fault between LCD and DSP, which also means that users can not check or set parameters through LCD control menu during this fault. **But this fault will not stop the inverter**, which is **different** from Fault condition.

5.3 Emergency Stop Button

The Emergency stop button will shutdown the inverter (disconnect the AC contactor) immediately when it is punched (pressed down).

The inverter must be started up manually through LCD control menu if users want to recover the operation after the button is punched.

How to Restart the Inverter after Using the Emergency Stop Button:

Users must manually restart the inverter according to the following procedure when the operation of the SG50K3 is stopped by punching the emergency stop button:

1. Turn the **emergency stop button clockwise** to release the inverter from the stop state.
2. Perform the **stop command** in the LCD menu.
3. Perform the **start command** in the LCD menu.
4. Then the inverter will restart.

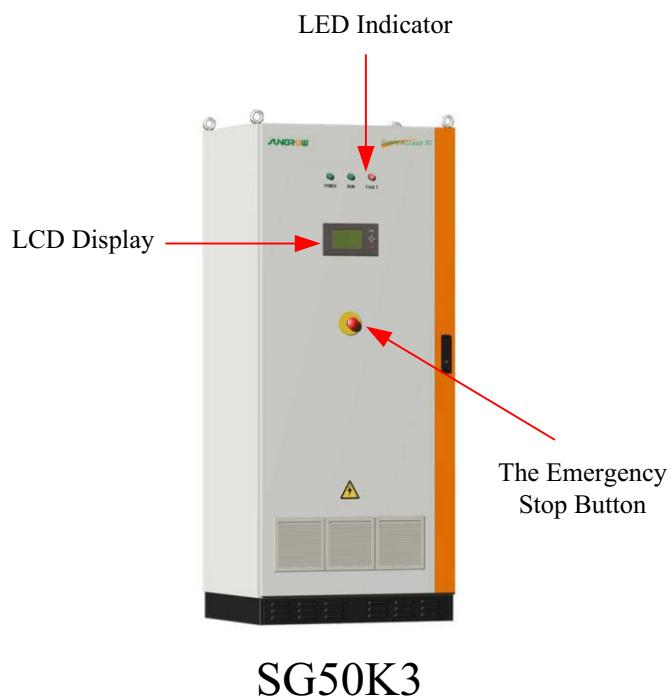


Fig 0 Emergency stop button positions

6. Data Interface

Users can get the running data and set parameters of SG50K3 from the LED indicators and LCD control panel, see figure 6.

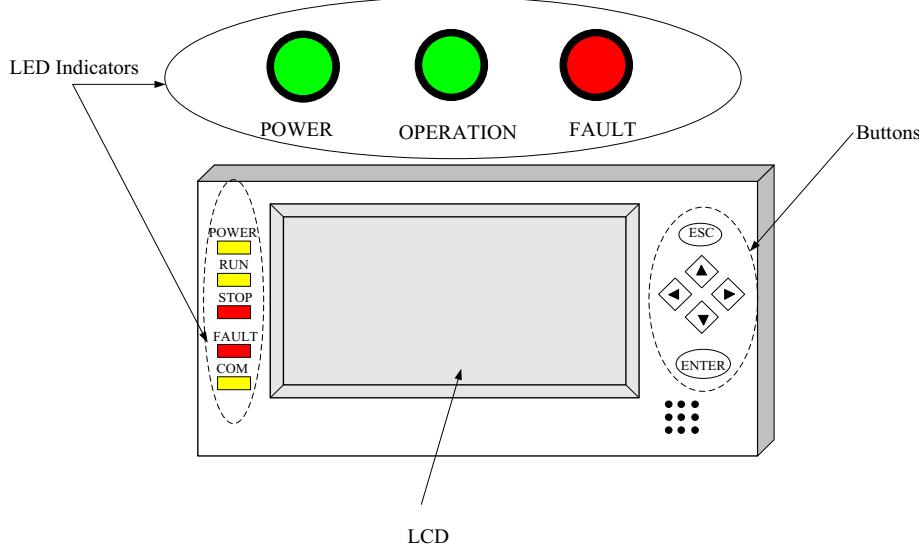


Fig 6 SG50K3 data interface

6.1 LED Indicators

3 big LED indicators are located in the front door of SG50K3 and 5 smaller LED indicators in the LCD panel.

These LED indicators help the users to quickly learn about the states of the SG50K3 inverter. Check Table 6-1 for their definitions.

Note that the big "POWER", "OPERATION" and "FAULT" LED indicators share the same meaning with small "POWER", "RUN" and "FAULT" indicators.

Table 6-1 Meaning of LED indicators

LED Name	Meaning
POWER	The indication of control board's power supply
RUN	Inverter is in grid mode and working normally
STOP	When the SG50K3 stops operation
FAULT	There is a fault in the power system
COM	Communication indication between inverter and PC

6.2 LCD Control Panel

The LCD control panel is mounted on the SG50K3 enclosure at eye level. 6 buttons right next to the LCD are used to check or set parameters in the LCD control menu, see Figure 7.

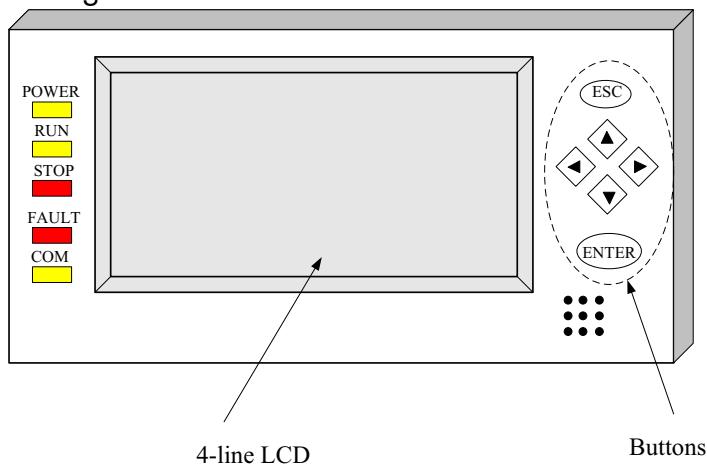


Fig 7 LCD panel

Table 6-2 Definitions of buttons

Button	function
ESC	cancels / ends the present function answers questions with "No" returns to the previous menu
▲	moves up to the previous line increases the present value
▼	moves down to the next line decreases the present value
►	moves to the right value
◀	moves to the left value
ENTER	selects a function from the menu selects a value/confirms changes/answers questions with "Yes"

The background illumination of the LCD is activated by pressing any button on the panel and will automatically be deactivated 2 minutes later to save power.

6.3 Explanation of the Display Symbols

The SG50K3 display has four lines. Multiple display symbols are used, which are explained in the following Table 0-3.

Table 0-3 Explanations of symbols used in the control menu

Symbol	Explanations
General Symbols	
	There is sub-level menu Press "Enter" to move to next menu
	There are more display menus below. Press "↓" to move to next menu
	This menu indicates some information needed to be care about
Specific Symbols	
	The PV array
	The Inverter
	One phase of the grid
	This menu displays data
	General control menu.
	Control the start/stop of the inverter.
	Communication parameters setting menu
	Energy adjustment menu
	General parameter menu
	Time setting menu
	Language setting menu

6.4 The Total Display Menu

The total display menu is given in the Fig 8 below.

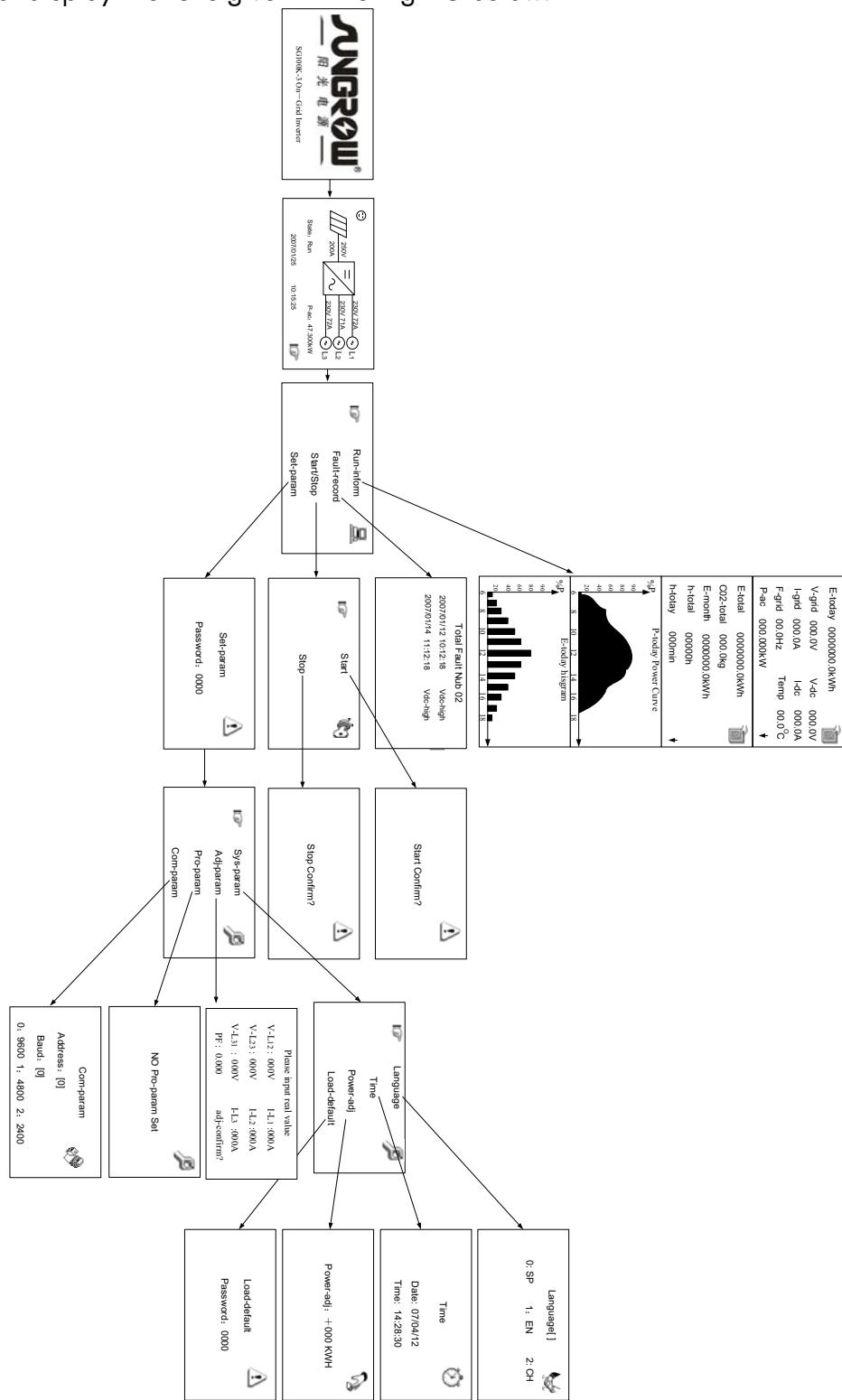


Fig 8 Total display menu tree

6.5 Additional Explanation of the LCD Menu

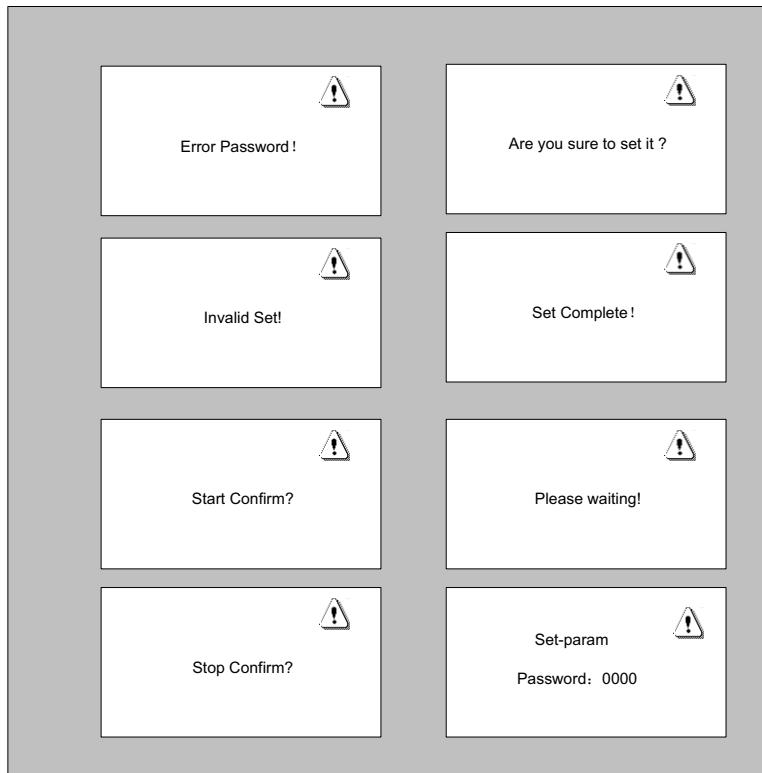
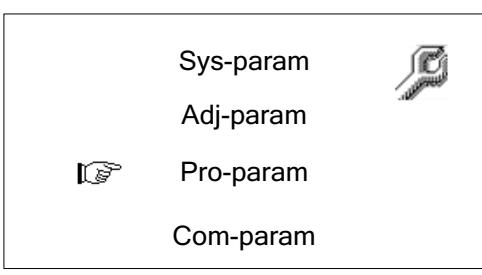
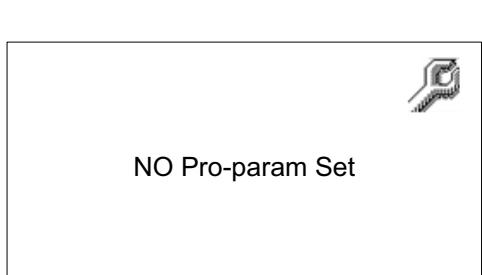


Fig 9 Prompting message menu

Fig.9 shows all the prompting messages not included in the total display menu but will be displayed in the LCD.

Note that the “**Pro-param**” menu contains no valid setting; it is kept for future protection parameters adjustment.

 <p>Sys-param </p> <p>Adj-param</p> <p> Pro-param</p> <p>Com-param</p>	<p>1. Select “Pro-param”</p> <p>2. Press “ENTER”</p>
 <p>NO Pro-param Set</p>	<p>3. No protection parameters can be set or adjusted</p>

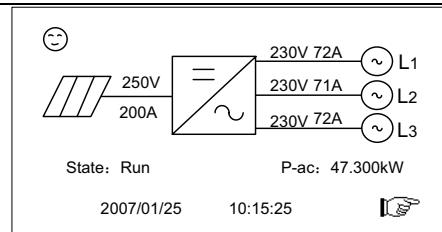
6.6 The Default Display Menu

The LCD is initialized upon energized of the SG50K3. A starting menu will be displayed during initialization, which shows the manufacture name and the type of the inverter.



1.The initialization menu

Only appear once after activation



2.The Default menu

Display basic running parameters

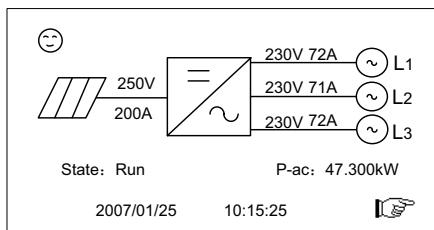
Once the LCD is initialized for about 2-3 minutes, it will automatically changes to the default menu. In the default menu, the basic real-time running values are displayed, which includes **DC current** and **DC voltage**, the **AC phase current** and **AC line-to-neutral voltage**, the **operation state**, the output **AC power** and the system time and date.



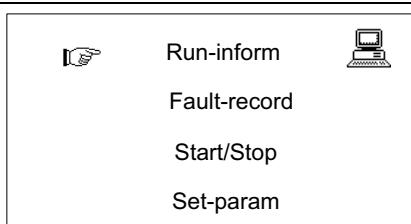
Note !!

Fault type will be displayed in the "State" of the default menu when a fault occurs.

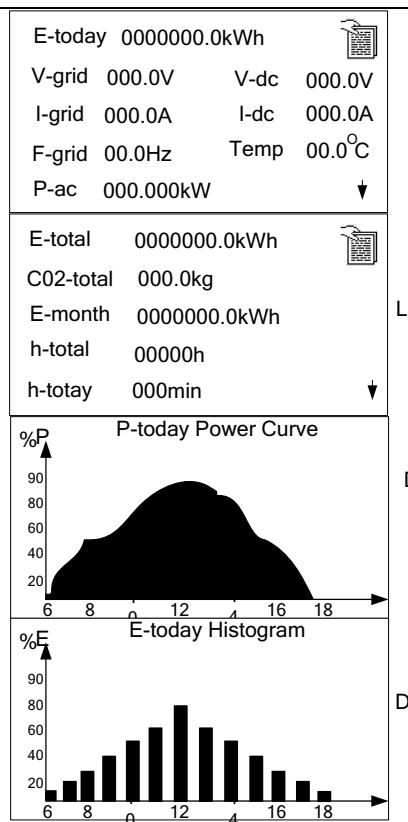
6.7 Check Running Parameters



- 1.In the default menu
- 2.Press "ENTER" or "▶" to enter the general control menu



- 3.Navigate the hand-pointer to the "Run-inform"
4. Press "ENTER" button to access the sub-menus of running parameters



Real time data

Logged data

Daily output power

Daily output energy

5. Use "▼" to move among these 4 menus to check parameters.

This level menus contains 4 separate menus:

- 1) the real-time data
- 2) the logged data
- 3) Daily output power diagram
- 4) Daily output energy diagram

Please refer to Table 0-3 and Table 0-4 for the explanations of displayed running data.

Table 0-3 Explanation of electrical parameters

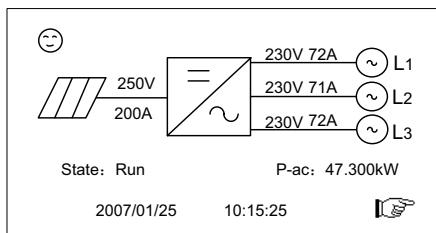
Data name	explanation	Unit
V-grid	Grid voltage	V
I-grid	Output AC current	A
F-grid	Grid frequency	Hz
V-dc	DC Voltage (of PV array)	V
I-dc	DC Current (of PV array)	A
P-ac	Output ac power	W
E-today	Energy generated today	KWH
E-month	Energy generated this month	KWH
E-total	The total generated Energy	KWH

Table 0-4 Explanation of non-electrical parameters

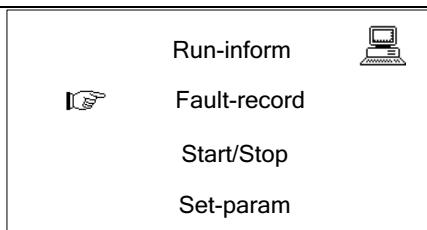
Data name	explanation	Unit
Temp	Temperature within the enclosure	°C
h-today	The Operation time of today	Min
h-total	Total hours of Operation time	H
CO2-total	Reduced CO2 weight	Kg

1. The internal logged data includes: total energy generated since the first start-“E-total”, energy generated within the current month-“E-month”, total running time in hour-“h-total”, the total running time within today- “h-today”, and the weight of the CO2 which can be avoided by using the green PV plant-“CO2-total”.
2. The **real time data includes**: daily generated energy “E-today”, the grid voltage “V-grid”, the grid frequency “F-grid”, the grid current “I-grid”, the DC voltage “V-grid”, DC current “I-grid”, the inverter’s inside temperature “Temp” and today’s running minutes “h-today”.
3. The “P-today power curve” diagram shows the power generated from 6.am to 18.pm in a single day, the data are updated every 3.75 seconds and the total diagram data will be cleared at the beginning of a new day. The P axis is marked by the percentage of the rated power 50KW.
4. The “E-today histogram” diagram shows the energy generated from 6.am to 18.pm in a single day, the data is updated every second and the length of the block is 1 hour. The total diagram data will be cleared at the beginning of a new day. The E axis is marked by the percentage of the 50KWH.

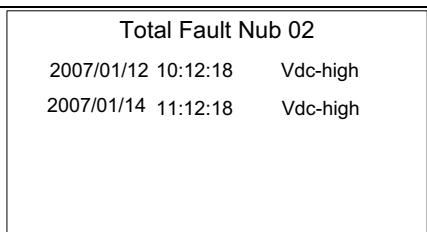
6.8 Check Fault Records



- 1.In the default menu
- 2.Press “ENTER” or “▶” to enter the general control menu



3. Navigate the hand-pointer to the “Fault-record” and press “ENTER” button.



4. Press “▼” button to move to left fault records.

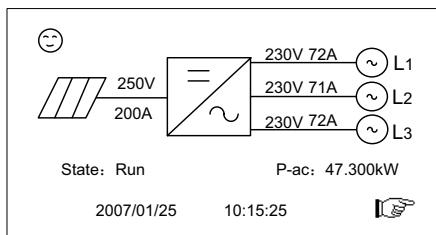
The “Fault-record” can log the latest 20 fault records, which includes the fault name and occurred time.

Note that one screen can only display 7 fault records, press “▼” button to move to next fault records if necessary.

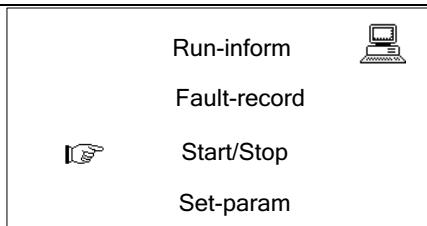
Table 0-5 Explanations of faults

Fault type	Explanations
Vdc-high	DC voltage is too high
Vac-high	Grid voltage is too high
Vac-low	Grid voltage is too low
F-fault	Grid frequency is abnormal
Island	Island(grid in unavailable)
Dsp-flt	The control DSP malfunctions
Ipm-flt	The IPM power module malfunctions
Cntr-flt	AC side contactor malfunctions
Ttp-high	Temperature of the main transformer is too high
Temp-flt	Temperature inside the enclosure is too high
Gnd-flt	A ground fault is occurred

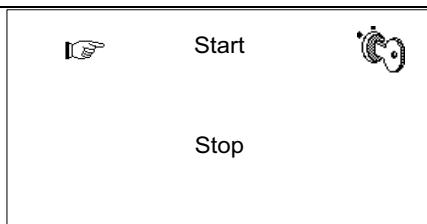
6.9 Start the Inverter



- 1.In the default menu
- 2.Press “ENTER” or “▶” to enter the general control menu



3. Navigate the hand-pointer to the “Start/Stop” and press “ENTER” button.



4. Navigate the hand-pointer to the “Start” and press “ENTER” button.



5. Press “ENTER” button to confirm the start command.

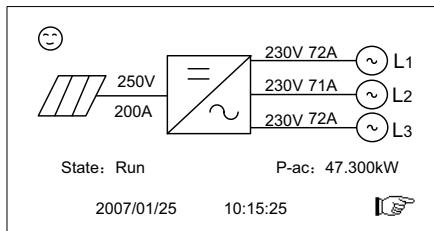
Note !!



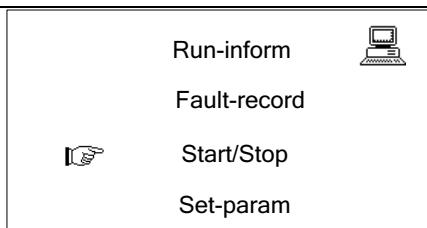
Normally the inverter will auto start when specifications are met or faults are removed.

The start function of the control menu is provided in case the inverter needs a restart after being stopped by pressing down the emergency stop button or perform manual stop in the LCD menu.

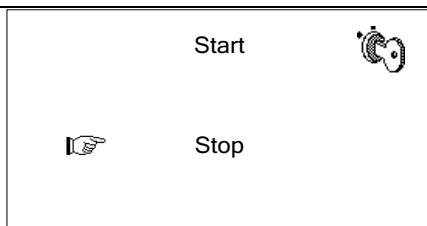
6.10 Stop the Inverter



- 1.In the default menu
- 2.Press “ENTER” or “▶” to enter the general control menu



3. Navigate the hand-pointer to the “Start/Stop” and press “ENTER” button.



4. Navigate the hand-pointer to the “Stop” and press “ENTER” button.



5. Press “ENTER” button to confirm the stop command.



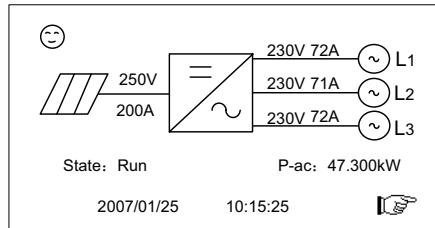
Note !

To the inverter, the emergency stop button has the same effect as the manual stop function.

They both disconnect the AC contactor and need manual Start in the LCD menu.

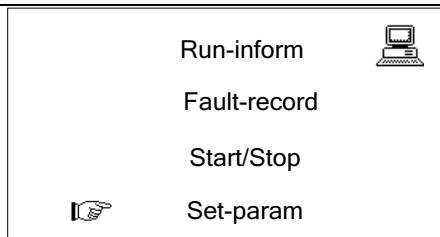
6.11 Entering the Password

SG50K3 parameters are password protected ,which means they can only be adjusted upon entry of a password. To enter the password, proceed as follows:

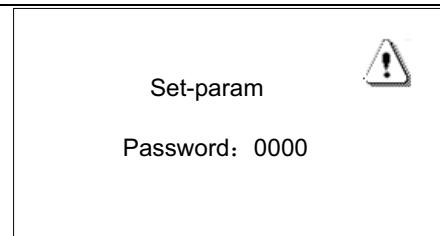


1.In the default menu

2.Press "ENTER" or "▶" to enter the general control menu



3. Navigate the hand-pointer to the "**Set-param**" and press "ENTER" button.

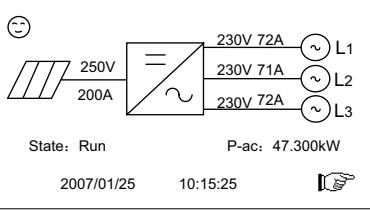
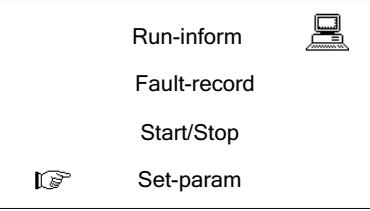
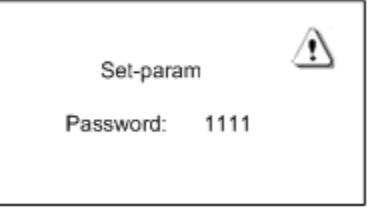
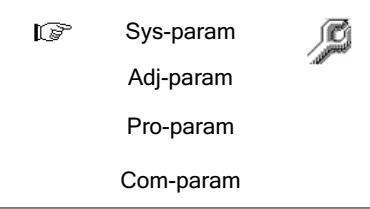
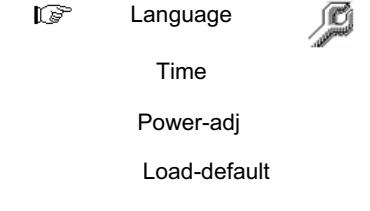
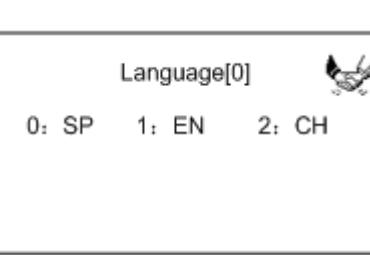


4. Use "◀"and "▶"to choose digits, employ "▲"and "▼" to increase or decrease number.

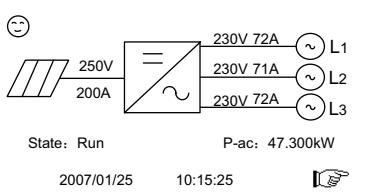
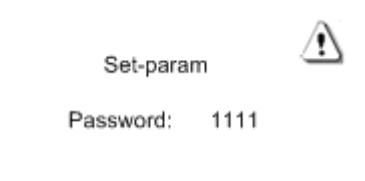
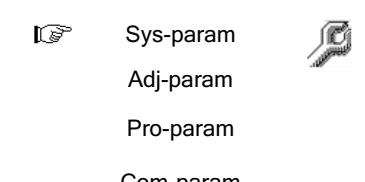
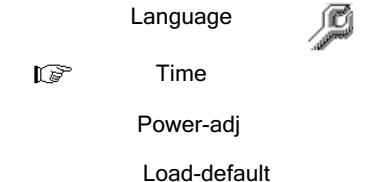


5. Press "ENTER" button to confirm the password input.
Note that the default password is 1111.

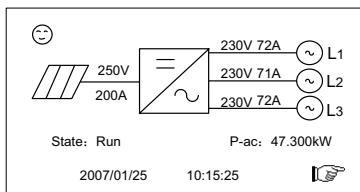
6.12 Change Display Language

	<p>1. In the default menu 2. Press “ENTER” or “▶” to enter the general control menu</p>
	<p>3. Navigate the hand-pointer to the “Set-param” and press “ENTER” button.</p>
	<p>4. Press “ENTER” button to confirm the password input. Note that the default password is 1111.</p>
	<p>5. Navigate the hand-pointer to the “Sys-param” and press “ENTER” button.</p>
	<p>6. Move the hand-pointer to the “Language” and press “ENTER” button.</p>
	<p>7. Use “▲”or “▼” to change number between 0, 1 and 2. 0 represents Spanish and 1 means English and 2 for Chinese. 8. Choose the number you want and press “Enter” to confirm your choice.</p>

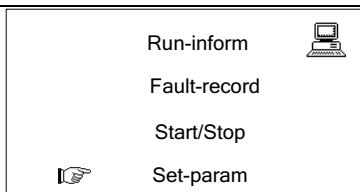
6.13 Change Date and Time

 <p>State: Run P-ac: 47.300kW 2007/01/25 10:15:25 </p>	<ol style="list-style-type: none"> 1.In the default menu 2.Press “ENTER” or “▶” to enter the general control menu
 <p>Run-inform </p> <p>Fault-record</p> <p>Start/Stop</p> <p> Set-param</p>	<ol style="list-style-type: none"> 3. Navigate the hand-pointer to the “Set-param” and press “ENTER” button.
 <p>Set-param </p> <p>Password: 1111</p>	<ol style="list-style-type: none"> 4. Press “ENTER” button to confirm the password input. Note that the default password is 1111.
 <p> Sys-param </p> <p>Adj-param</p> <p>Pro-param</p> <p>Com-param</p>	<ol style="list-style-type: none"> 5. Navigate the hand-pointer to the “Sys-param” and press “ENTER” button.
 <p> Language </p> <p>Time</p> <p>Power-adj</p> <p>Load-default</p>	<ol style="list-style-type: none"> 6. Move the hand-pointer to the “Time” and press “ENTER” button.
 <p>Time </p> <p>Date: 07/04/12</p> <p>Time: 14:28:30</p>	<ol style="list-style-type: none"> 7. Use “◀”and “▶”to choose digits, employ “▲”and “▼” to increase or decrease number. 8. Input the number you want according to your local time and press “Enter” to confirm them.

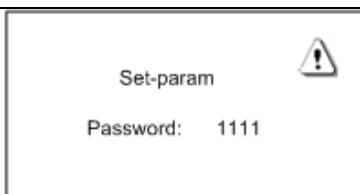
6.14 Output Energy Value Adjustment



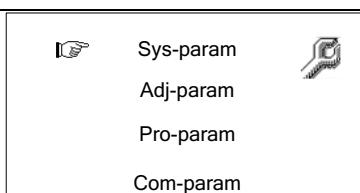
- 1.In the default menu
- 2.Press “ENTER” or “▶” to enter the general control menu



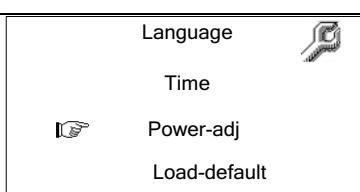
3. Navigate the hand-pointer to the “Set-param” and press “ENTER” button.



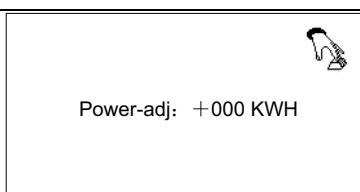
4. Press “ENTER” button to confirm the password input. Note that the default password is 1111.



5. Navigate the hand-pointer to the “Sys-param” and press “ENTER” button.



6. Move the hand-pointer to the “Power-adj” and press “ENTER” button.



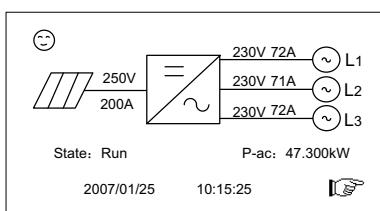
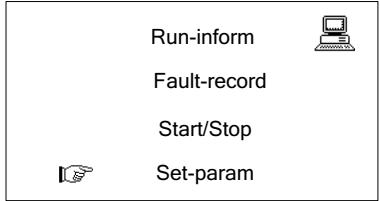
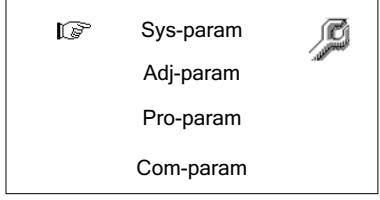
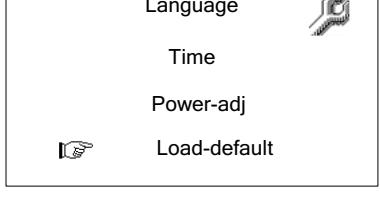
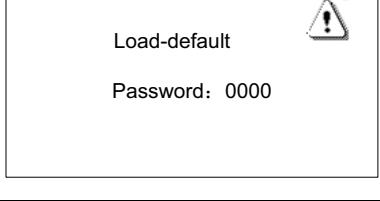
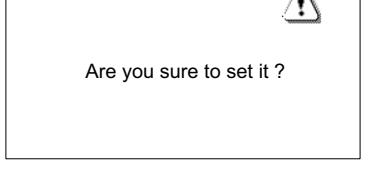
7. Use “◀”and “▶”to choose digits, employ “▲”and “▼” to increase or decrease number.
8. Input real value you read from your electric meter and press “Enter” to confirm them.

Note that the positive symbol “+” can also be changed to negative symbol “-”. This generated power adjustment screen is useful in case the total-power displayed by LCD (**E-total**) has difference with reading value from the external power measuring device (like an electrical meter).

The adjustable range is from -999--+999 kWh.

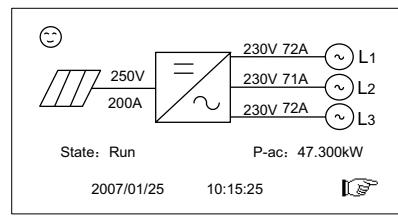
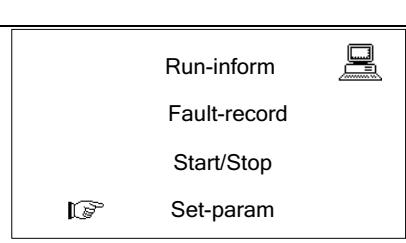
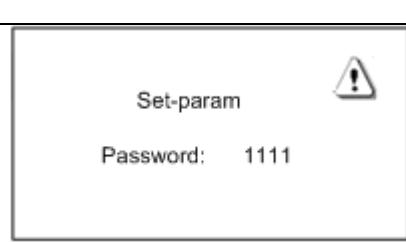
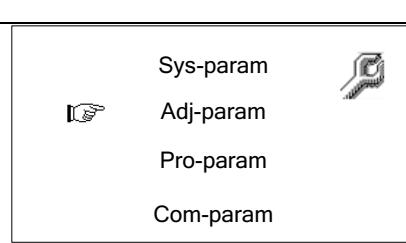
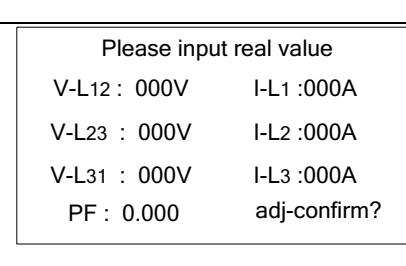
(Power-adj value)= (Real measured value)-(E-total reading value)

6.15 Load Default Setting

	<p>1. In the default menu</p> <p>2. Press "ENTER" or "▶" to enter the general control menu</p>
	<p>3. Navigate the hand-pointer to the "Set-param" and press "ENTER" button.</p>
	<p>4. Press "ENTER" button to confirm the password input. Note that the default password is 1111.</p>
	<p>5. Navigate the hand-pointer to the "Sys-param" and press "ENTER" button.</p>
	<p>6. Move the hand-pointer to the "Load-default" and press "ENTER" button.</p>
	<p>7. Input correct password 1111 and press "Enter".</p>
	<p>8. Press "Enter" to re-confirm your load default command.</p>

After load default, all the logged data and fault will be cleared.

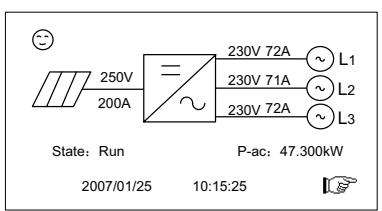
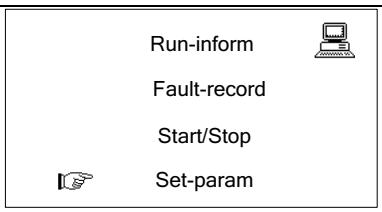
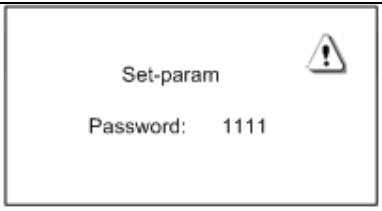
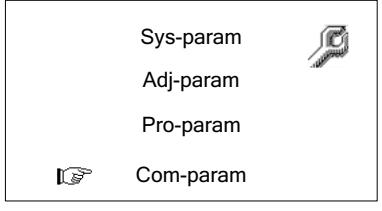
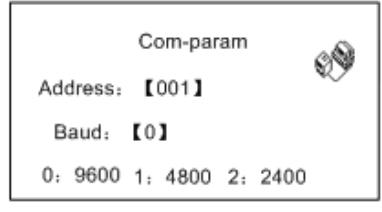
6.16 Displayed Real-time Parameters Adjustment

 <p>State: Run P-ac: 47.300kW 2007/01/25 10:15:25 </p>	<ol style="list-style-type: none"> 1. In the default menu 2. Press "ENTER" or "▶" to enter the general control menu
 <p>Run-inform Fault-record Start/Stop  Set-param</p>	<ol style="list-style-type: none"> 3. Navigate the hand-pointer to the "Set-param" and press "ENTER" button.
 <p> Set-param Password: 1111</p>	<ol style="list-style-type: none"> 4. Press "ENTER" button to confirm the password input. Note that the default password is 1111.
 <p> Sys-param Adj-param Pro-param Com-param</p>	<ol style="list-style-type: none"> 5. Navigate the hand-pointer to the "Adj-param" and press "ENTER" button.
 <p>Please input real value V-L12 : 000V I-L1 :000A V-L23 : 000V I-L2 :000A V-L31 : 000V I-L3 :000A PF : 0.000 adj-confirm?</p>	<ol style="list-style-type: none"> 6. Use "◀" and "▶" to choose digits, employ "▲" and "▼" to increase or decrease number. 8. Input real value you read from your electric meter and press "Enter" to confirm them.

The "Adj-param" menu is designed to adjust the difference between the LCD displayed value and the users measured real value and perform the adjustment of displayed real data.

"V-L12","V-L23","V-L31" are the user measured three phase line to line voltage,"I-L1","I-L2","I-L3" are the user measured three phase current. PF is measured power factor.

6.17 Communication Parameters Setting

	<p>1.In the default menu 2.Press “ENTER” or “▶” to enter the general control menu</p>
	<p>3. Navigate the hand-pointer to the “Set-param” and press “ENTER” button.</p>
	<p>4. Press “ENTER” button to confirm the password input. Note that the default password is 1111.</p>
	<p>5. Navigate the hand-pointer to the “Com-param” and press “ENTER” button.</p>
	<p>6. Use “◀”and “▶”to choose digits, employ “▲”and “▼” to increase or decrease number. 8. Input the address and baud rate you want.</p>

“Com-param” menu contains some basic communication parameters of the inverter when connected to external monitoring device through RS485 serial communication protocol. The inverter communication address can be in the first line. The range of the address is 0-255. The serial communication baud rate can be adjusted through entering 0, 1 and 2 in the second line. 0 represents 9600 Baud, 1 means 4800 Baud and 2 for 2400 Baud.



Note!

The address parameter is very important when your solar generation application contains many inverters and each inverter should have a unique address for serial communication.

7 Installation

This chapter gives installation instructions for SG50K3.

7.1 Checking for Shipping Damage

The **SG50K3** inverters are thoroughly checked and tested rigorously before they are shipped. Even though they are delivered in a rugged, heavy cardboard box, the inverters can be damaged in shipping which typically is the shipping company's fault. So you should check the inverter before installation.

Please inspect the inverter thoroughly after it is delivered. If any damage is seen please immediately notify the shipping company. If there is any question about potential shipping damage, contact Sungrow Power Supply. A photo of the damage may be helpful.

Do not accept unit if visibly damaged or note visible damage when signing shipping company receipt. Please report the damage immediately to the shipping company. Do not remove the unit from packaging.

7.2 Basic Installation Requirements

The IP level of SG50K3 is **IP20**, so it can only be installed **indoors**.

A list of these requirements is shown below:

- It is advised not to install the inverter in living quarters, since the inverter may produce some operating noise (< 40 dB).
- Avoid installing the inverter in a location subject to vibrations.
- The LED and display should always be legible for users.
- The ambient temperature should remain from –25°C to 55°C (auxiliary heater needed).
- It is important to have air freely circulating around the inverter; therefore keep the area within 30 centimeters of the inverter free from obstacles.
- The inverter should be mounted in a well-ventilated area.
- Avoid mounting the inverter in a dusty area

7.3 Mechanical Mounting

7.3.1 Safety Mounting Instructions

As with any electrical system, touching live components can be hazardous to life and limb. This device contains DC voltage of up to **880V** and the grid voltage up to 450 V.

WARNING!



Only a qualified person can work on this equipment.
This work is only permissible if the AC and DC power supplies are safely disconnected from the SG50K3.

WARNING!



Before any maintenance, always wait for approx.10 minutes so that the capacitors in the SG50K3 can discharge. Only then may the cover be opened.

7.3.2 Device Dimensions and Weight

The external dimensions and weight of the SG50K3 is in fig 9.



Fig.9 Dimensions of SG50K3

NOTICE!



The ambient temperature should be within -25°C and +55°C.

Caution!



Some parts of the SG50K3 can reach temperature of over 80°C. Keep a suitable distance from flammable materials!

WARNING!



Never install the SG50K3 in areas that contain explosive atmospheres (battery rooms, fuel storage rooms etc).

7.4 Electrical Connection

7.4.1 Electrical Connection Requirements

- Grid 230V AC

The SG50K3 is designed for 400V grid (three phase).The voltage should be within 310V to 450V and the frequency should be the frequency should be 47-51.5/57-61.5Hz.

Grid Voltage Range: 310V-450V
Grid Frequency Range: 47-51.5/57-61.5Hz

- PV array limit

Max. PV Power: 55 KW
Max. PV Voltage : 880V

- ground

The inverter must be grounded in compliance with local safety codes using appropriately sized protective conductors.



Notice!

All electrical installations must comply with all local and national electrical codes.



WARNING: Make sure that the DC input voltage never exceeds 880V.Higher input voltages will damage the SG50K3.

7.4.2 Wires connection

The complete wiring for a SG50K3 is shown schematically in the Fig.10.

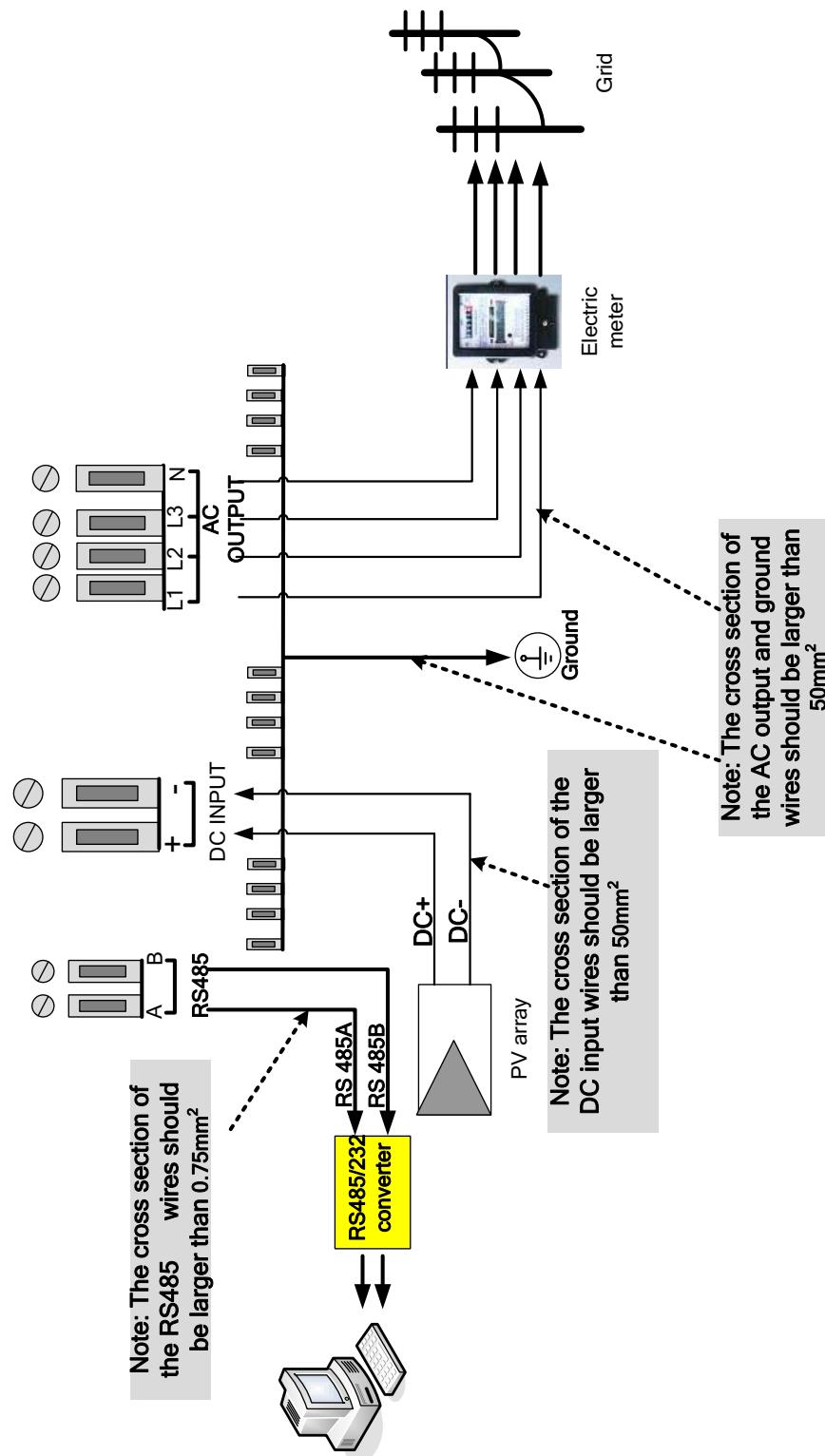


Fig. 10 Simplified electrical connection diagram



Caution!

The wiring of the inverter's AC and DC cables must only be done with the DC and AC circuit breakers are in the off state.

Please follow the steps below:

- Isolate the grid (switch off the circuit breaker), and secure it against accidental reactivation.
- Connect the wires of the AC cable as follows(through circuit breaker):
 - ✧ Grid L1 wire to the terminal marked "L1".
 - ✧ Grid L2 wire to the terminal marked "L2".
 - ✧ Grid L3 wire to the terminal marked "L3".
 - ✧ Grid Neutral wire to the terminal marked "N".
- Connect the DC terminals
 - ✧ PV array DC+ wire to the inverter DC+.
 - ✧ PV array DC - wire to the inverter DC -.
 - ✧ Connect the ground copper bar to the ground.
- Connecting the RS485A/B wires **only if users have purchase our RS485/232 Converter and monitoring software.**
- Please make sure that all wires are firmly connected.



Caution!

Make sure tall the wires are firmly tightened.

7.5 Communication Installation

Fig.11 shows the communication installation of the SG50K3 with the PC by RS485 serial communication port.

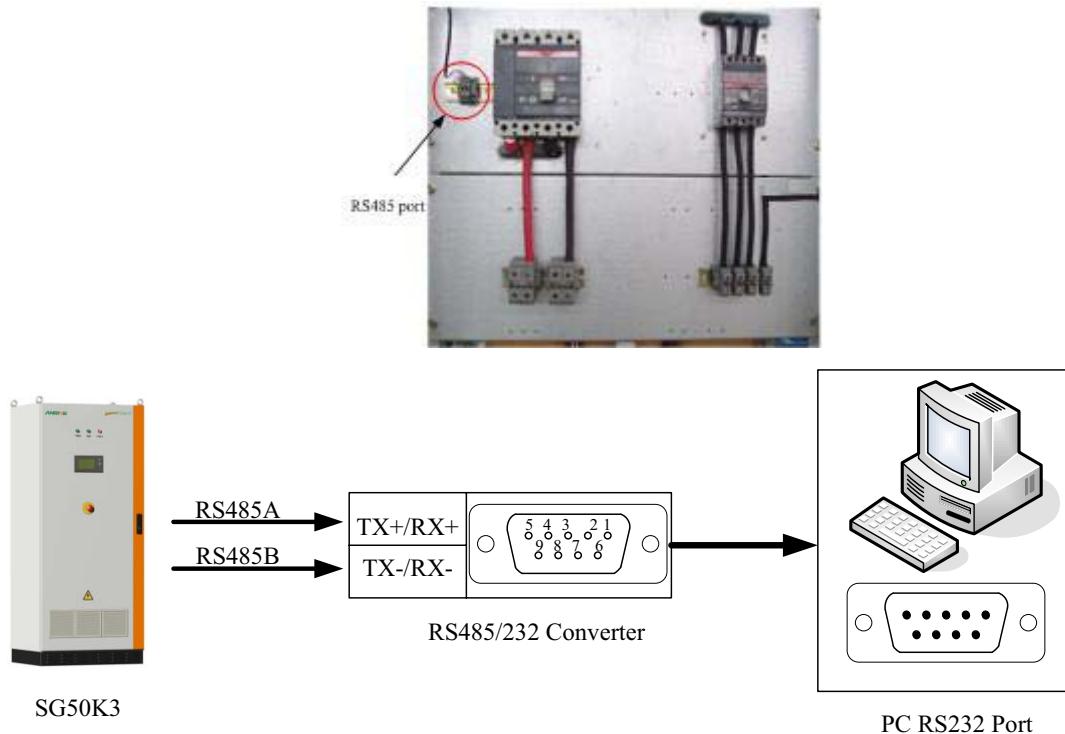


Fig.11 Communication port configuration

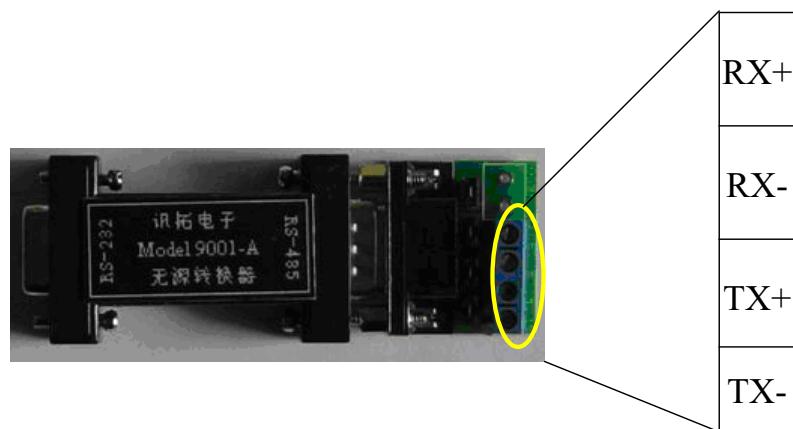


Fig.12 RS485/RS232 converter

7.6 Start and close

7.6.1 Start the Inverter

To turn on the inverter, please follow the steps below.

- 1) Switch on the DC side circuit breaker
- 2) Switch on the AC side breaker
- 3) The inverter will check whether that voltage, impedance and frequency parameters are within operating range.
- 4) If the parameters check is correct, then the LCD will display the normal working screen.
- 5) Then the inverter will export to the grid and the green Power LED will continuously lit (provided there is enough PV power).

7.6.2 Close the Inverter

- 1) If users want to shut down the inverter, please refer to stop command in the LCD menu in chapter 6.
- 2) If users want to shut down the inverter immediately in an emergency, please press down the emergency stop button. .

8 Technical Data

8.1 Electrical Specifications

■ Input Data

Max. PV Power	55kW
Max. Input Current	130A
MPP Voltage Range	450-820V
Maximum DC Voltage	880V

■ Output Data

Nominal AC output power	50kW
AC Voltage Range	310 – 450 V AC
AC Frequency Range	47-51.5/57-61.5Hz
Power Factor	>0.99 at nominal power
Peak Efficiency	95.5 %
European Efficiency	94.8 %
THD of Output Current	< 3 % at nominal power

8.2 Mechanical Specifications

Dimensions(W x H x D)	820x1964 x646 mm
Weight	700 kg
Ingress Class	IP20 (indoor)
Operating Temperature	-25°C ~55°C

8.3 Features

Cooling	Forced air fan cooling
Display	LCD
Communication	RS485/Ethernet(Optional)/GPRS(Optional)
EMC	EN61000-6-2 EN61000-6-4
Safety	EN 50178

9. Appendix

9.1 Exclusion of Liability

The content of these documents is periodically checked and revised, when necessary, please call us or check our website www.sungrowpower.com for the latest information. However discrepancies cannot be excluded. No guarantee is made for the completeness of these documents. Please contact our company or distributors to get the latest version. Guarantee or liability claims for damages of any kind are excluded if they are caused by one or more of the following:

- .Improper or inappropriate use of the product
- .Operating the product in an unintended environment
- .Operating the product when ignoring relevant safety regulations in the deployment location
- .Ignoring safety warnings and instructions contained in all documents relevant to the product
- .Operating the product under incorrect safety or protection conditions
- .Altering the product or supplied software without authority
- .The product malfunctions due to operating attached or neighboring devices beyond allowed limit values.

In case of unforeseen calamity or force majeure.

9.2 Contact Us

If you have any questions about or technical problems with the SG50K3, our hotline will be happy to assist you. Please keep the following data when contacting Sungrow.



Address::

Sungrow Power Supply Co.,ltd

No.2 Tianhu Road, Gao xin district Hefei, Anhui, 230088, P.R.China

Tel.: +86-551-5327834

Fax: + 86-551-5327800

Website: <http://www.sungrowpower.com>

